Initiative creates more secure environment for cloud computing

June 17 2010

Scientists at the University of Texas in Dallas, with funding from AFOSR's Multidisciplinary University Research Initiative, are seeking solutions for maintaining privacy in a cloud, or an Internet-based computing environment where all resources are offered on demand.

Dr. Bhavani Thuraisingham has put together a team of researchers from the UTD School of Management and its School of Economics, Policy and Political Sciences to investigate information sharing with consideration to confidentiality and privacy in cloud computing.

"We truly need an interdisciplinary approach for this," she said. "For example, proper economic incentives need to be combined with secure tools to enable assured information sharing."

Thuraisingham noted that cloud computing is increasingly being used to process large amounts of information. Because of this increase, some of the current technologies are being modified to be useful for that environment as well as to ensure security of a system.

To achieve their goals, the researchers are inserting new security programming directly into software programs to monitor and prevent intrusions. They have provided additional security by encrypting sensitive data that is not retrievable in its original form without accessing encryption keys. They are also using Chinese Wall, which is a set of policies that give access to information based on previously viewed data.

The scientists are using prototype systems that can store semantic web data in an encrypted form and query it securely using a web service that provides reliable capacity in the cloud. They have also introduced secure software and hardware attached to a database system that performs security functions.

Assured information sharing in cloud computing is daunting, but Thuraisingham and her team are creating both a framework and incentives that will be beneficial to the Air Force, other branches of the military and the private sector.

The next step for Thuraisingham and her fellow researchers is examining how their framework operates in practice.

"We plan to run some experiments using online social network applications to see how various security and incentive measures affect information sharing," she said.

Thuraisingham is especially glad that AFOSR had the vision to fund such an initiative that is now becoming international in its scope.

"We are now organizing a collaborative, international dimension to this project by involving researchers from Kings College, University of London, University of Insubria in Italy and UTD related to secure query processing strategies," said AFOSR program manager, Dr. Robert Herklotz.

Provided by Air Force Office of Scientific Research